## Claims

What is claimed is:

1. A magnetic memory device comprising one or more free magnetic layers, the one or more free magnetic layers comprising a low magnetization material adapted to have a saturation magnetization of less than or equal to about 600 electromagnetic units per cubic centimeter.

2. The device of claim 1, configured such that a ratio of mean switching field associated with an array of non-interacting magnetic memory devices and a standard deviation of the switching field is greater than or equal to about 20.

3. The device of claim 1, further comprising at least one non-magnetic layer between the one or more free magnetic layers.

4. The device of claim 1, wherein the low magnetization material has a saturation magnetization of less than or equal to about 500 electromagnetic units per cubic centimeter.

5. The device of claim 2, wherein the ratio is dependent on a thickness of the one or more free magnetic layers.

6. The device of claim 1, wherein the one or more free layers exhibit an anisotropy of less than or equal to about 20 oersteds.

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B 7. The device of claim 1, wherein the one or more free layers exhibit an anisotropy of greater than or equal to about 20 oersteds.

8. The device of claim 1, wherein the low magnetization material comprises a nickel-iron alloy.

9. The device of claim 1, wherein the low magnetization material is adapted to have a saturation magnetization of less than or equal to about 600 electromagnetic units per cubic centimeter by inclusion of a moment-reducing element into the low magnetization material.

10. The device of claim 9, wherein the moment-reducing element is selected from the group consisting of germanium, boron, vanadium, molybdenum, osmium and combinations comprising at least one of the foregoing elements.

11. The device of claim 1, having a switching field of less than or equal to about 120 oersteds.

12. The device of claim 1, having a switching field of less than or equal to about 60 oersteds.

13. A method of producing a magnetic memory device having one or more free magnetic layers comprises the step of tuning the saturation magnetization of the one or more free magnetic layers to have a saturation magnetization of less than or equal to about 600 electromagnetic units per cubic centimeter.